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Application No.: 10/074,600
Filed: February 12, 2002
TC Art Unit: 2157
Confirmation No.: 4837

REMARKS

The foregoing Amendment is filed in response to the official action dated May 15, 2006. Reconsideration is respectfully requested.

The status of the claims is as follows:

Claims 1-16 are currently pending.

Claims 1-16 stand rejected.

Claims 1 and 9 have been amended.

Claims 17-18 have been added.

The Examiner has rejected claims 1-16 under 35 U.S.C. 102(e) as being anticipated by Behzadi (USP 6,728,220). The Applicants respectfully submit, however, that base claims 1 and 9, as amended, and the claims depending therefrom, are not anticipated by the art of record, and therefore the rejections of claims 1-16 under 35 U.S.C. 102 should be withdrawn.

For example, amended claim 1 recites a data communications network, including an end station, a data communications ring configured for spatial reuse, and a plurality of nodes coupled to the ring. The plurality of nodes includes first and second bridges, in which the first bridge is also coupled to the end station. The second bridge is operative (1) to learn an association between the first bridge and the end station, and (2)

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upon receiving a packet destined for the end station: (i) to forward the received packet as a broadcast transmission in a manner indicating that the packet is to be examined by each of the plurality of nodes on the ring, in the event that the association between the first bridge and the end station has not yet been learned, and (ii) to forward the received packet as a unicast transmission between the second bridge and the first bridge on the ring, in the event that the association between the first bridge and the end station has been learned. Such a data communications network is described throughout the instant application, for example, see page 6, line 27, to page 7, line 27, and page 8, lines 17-21, of the application.

The Behzadi reference discloses a method and system for preventing transmission loops between a group of network nodes that are connected to form a ring (see column 1, lines 7-10, of Behzadi). Specifically, the Behzadi reference discloses the known technique of "flooding", which may be employed to deliver packets to a destination node, and to learn the route to the destination node for subsequent packet transmissions. As disclosed in the Behzadi reference, packets can be sent from a Host A to a Host B through a ring network, in which the location of the Host B is initially unknown to a plurality of label switch routers (LSRs)

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330, 332, 334, 336, 338, 340, 342 coupled to the ring (see Fig. 3 of Behzadi). The Host A transmits the packets, addressed to the Host B, on all of its active ports. Next, the packets are received by the LSR 342, which, assuming it has no knowledge of the Host B in its look-up tables, floods the packets on all of its ports, except for the port on which the packets were received. Assuming that the left and right neighbor LSRs 330, 340 of the LSR 342 also have no knowledge of the Host B, these neighboring LSRs similarly flood the packets on all of their ports, except for the ports on which the packets were received. This process of flooding continues at the remaining LSRs 332, 334, 336, 338 until the Host B is finally reached by flooding at the LSR 336. Once the Host B is reached, the Host B can send packets back to the Host A, thereby enabling all of the intermediate nodes 330, 332, 334, 336, 338, 340, 342 on the ring to learn the location of the Host B. Because the location of the Host B is now known by the LSRs 330, 332, 334, 336, 338, 340, 342, the LSRs can update their look-up tables with the location of the Host B, and subsequent transmissions of packets to the Host B can be performed without flooding the packets on the network (see column 6, lines 23-57, and Fig. 3, of Behzadi).

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The Applicants respectfully submit that the known flooding technique, as disclosed by Behzadi, is significantly different from a "directed bridging" technique employed by the data communications network of claim 1 (see page 6, lines 27-30, of the application). For example, the flooding technique of the Behzadi reference allows a packet, transmitted from the Host A, to reach its destination, *i.e.*, the Host B, when the location of the Host B is unknown. Further, subsequent transmissions of packets from the Host B to the Host A allow the other nodes on the network to update their look-up tables to include the location of the Host B. As a result, subsequent packet transmissions from the Host A to the Host B would not require flooding, since each of the nodes on the network have knowledge of the location of the Host B.

Whereas the flooding technique of the Behzadi reference requires each node on a network to flood packets on all of its ports (except for the port on which the packets were received) when the location of a destination node is unknown, the directed bridging technique employed by the data communications network of claim 1 requires the second bridge to forward a packet as a broadcast transmission in a manner indicating that the packet is to be examined by each of the plurality of nodes on the ring, if the association between the first bridge and the end station has

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not yet been learned by the second bridge. The Applicants respectfully point out that *flooding* packets on a network is *not* the same as *broadcasting* a packet on a network.

As discussed above, the flooding technique requires the Host A, each of the LSRs 330, 332, 334, 336, 338, 340, 342 coupled to the ring, and the router 348, to flood packets on *all* of their ports (except for the ports on which the packets were received). In other words, the Host A sends packets to *all* of its neighbors, which in turn send packets to *all* of their neighbors, and so on. For example, the Host A sends packets to all of its neighbors including the LSR 342, which sends packets to all of its neighbors including the LSRs 330, 340. In turn, the LSRs 330, 340 send packets to all of their neighbors including the LSRs 332, 338. Similarly, the LSRs 332, 338 send packets to all of their neighbors including LSRs 334, 336, which send packets to all of their neighbors including the LSRs 334, 336 and the router 348. Finally, the router 348 sends packets to all of its neighbors including the Host B.

In contrast, the second bridge forwards the received packet as a broadcast transmission in a manner indicating that the packet is to be examined by each of the plurality of nodes on the ring, in the event that the association between the first bridge and the

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end station has not yet been learned, as recited in amended claim 1. Unlike the flooding technique, the broadcast transmission of amended claim 1 does not require the second bridge to send the received packet to all of its neighbors, nor does it require each of the second bridge's neighbors to send packets to all of their neighbors, and so on. Instead, the broadcast transmission of claim 1 merely requires the second bridge to forward the received packet in a manner indicating that the packet is to be examined by each of the plurality of nodes on the ring, as recited in amended claim 1. As a result, the broadcast transmission of the packet circulates entirely around the ring. Such circulation of the broadcast packet around the ring is achieved by requiring each node on the ring to examine the packet, not by requiring each node on the ring to send the packet to all of its neighbors, and so on, as in the flooding technique.

In addition, in the flooding technique, once the location of the destination node is made known to the network nodes, a packet can be forwarded from a source node to the destination node over the network, in which each node forwards the packet based upon the location information for the destination node contained in its look-up tables. In contrast, in the directed bridging technique, once the association between the first bridge and the end station

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is learned by the second bridge, the second bridge forwards the received packet as a unicast transmission *between the second bridge and the first bridge* on the ring, as recited in amended claim 1. As a result, the unicast transmission of the packet is performed between two distinct points on the ring, specifically, the second bridge and the first bridge, rather than requiring the transmission to circulate around the entire ring, as in broadcast transmissions.

Unlike the flooding technique of Behzadi, in which packets can be forwarded from *source node* to *destination node* once the location of the destination node is made known, the data communications network of claim 1 can employ the directed bridging technique to forward packets as unicast transmissions from *the second bridge* to *the first bridge*, once the association between the first bridge and the end station has been learned by the second bridge. The Applicants respectfully point out that the unicast transmission of amended claim 1 does not forward the packet from *source-to-destination* like the flooding technique of Behzadi, but instead employs the directed bridging technique to forward the packet from the second bridge to the first bridge, *i.e.*, from *bridge-to-bridge*. The first bridge can then forward

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the packet to its intended destination, *i.e.*, the end station coupled thereto.

The flooding technique of Behzadi is therefore significantly different from the directed bridging technique described in the instant application, and employed by the data communications network of claim 1. Whereas the flooding technique of the Behzadi reference is concerned with delivering packets from the source node, *e.g.*, the Host A (see Fig. 3 of Behzadi), to the destination node, *e.g.*, the Host B (see Fig. 3 of Behzadi), *i.e.*, from *source-to-destination*, the data communications network of amended claim 1 focuses upon forwarding packets as unicast transmissions, whenever possible, from the second bridge to the first bridge, *i.e.*, from *bridge-to-bridge*.

As recited in new claim 17, the second bridge forwards a packet as a unicast transmission when the association between the first bridge and the end station has been learned, particularly, when the first information contained in the packet identifies the end station as one of the source node and the destination node of the packet, and when the second information contained in the packet identifies the first bridge as one of the ingress node and the egress node for the packet. By using unicast transmissions, whenever possible, to reduce the bandwidth requirements for

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forwarding packets from one ring network to another, the claimed data communications network allows the data transmission capacity of the ring networks to be used more efficiently (see page 6, lines 1-4, of the application).

Because the Behzadi reference neither teaches nor suggests a data communications network including an end station, a data communications ring configured for spatial reuse, and a plurality of nodes coupled to the ring, the plurality of nodes including first and second bridges, the first bridge also being coupled to the end station, wherein the second bridge is operative (1) to learn an association between the first bridge and the end station, and (2) upon receiving a packet destined for the end station: (i) to forward the received packet as a broadcast transmission in a manner indicating that the packet is to be examined by each of the plurality of nodes on the ring, in the event that the association between the first bridge and the end station has not yet been learned, and (ii) to forward the received packet as a unicast transmission between the second bridge and the first bridge on the ring (*i.e.*, from *bridge-to-bridge*), in the event that the association between the first bridge and the end station has been learned, as recited in claim 1, the Applicants respectfully submit that the Behzadi reference does not anticipate claim 1 and claims

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2-8 and 17 depending therefrom. For at least the reasons provided above with reference to claim 1, the Applicants further submit that the Behzadi reference does not anticipate amended base claim 9 and claims 10-16 and 18 depending therefrom. It is therefore respectfully submitted that the rejections of claims 1-16 under 35 U.S.C. 102 should be withdrawn.

In view of the foregoing, it is respectfully submitted that the present application is in a condition for allowance. Early and favorable action is respectfully requested.

The Examiner is encouraged to telephone the undersigned Attorney to discuss any matter that would expedite allowance of

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the present application.

Respectfully submitted,

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